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MEMORANDUM FOR: The Record

From: Lisa M. Blumerman **(signed May 25, 2016)**
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Subject: 2020 Census Business Solution Architecture

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This memorandum documents the 2020 Census Program decision to use a Commercial Off-the-Shelf (COTS) platform as part of Census Enterprise Data Collection and Processing Program (CEDCaP) for the data collection component of the Business Solution Architecture. The 2020 Census Business Solution Architecture will consist of a combination of CEDCaP and non-CEDCaP systems, to support the overall 2020 Census program.

Overview

In 2012, the Census Bureau embarked on an initiative to create an enterprise-wide approach to data collection and processing. In the past, survey and census programs created their own collection and processing systems. The Census Bureau would build, buy or lease the technology needed to complete a successful census. This led to duplication by having custom systems all performing similar functions. Creating an enterprise-wide approach to data collection and processing that is adaptable based on each customer's needs will lead to a more streamlined workflow for Census Bureau programs focused on the 2020 Census. In planning for the 2020 Census, as an organization we examined how we could leverage the developed tools and methodologies planned for the 2020 Census across all programs at the Census Bureau.

The 2020 Census Operational Plan laid out a series of tests and decision points that the Census Bureau will make in the years leading up to the 2020 Census to develop innovative and efficient

methods to increase the response rates, decrease the number of door-to-door interviews, raise workforce productivity, and streamline operations without sacrificing the accuracy of the census. These changes have the potential to save taxpayer money (compared to the cost of repeating 2010 methods in 2020), maintain accuracy and reduce the burden on respondents. To achieve this, the 2020 Census Program will rely on many of the systems covered by the CEDCaP approach as one part of the overall Business Solution Architecture.

Background

The Census Bureau issued a Request for Information (RFI) on December 12, 2014 to solicit information about the experience and expertise of vendors in the industry to provide components of CEDCaP capabilities through Commercial Off-the Shelf (COTS) Platforms and Software. The Census Bureau garnered a great deal of interest from the vendor community in reference to this requirement and received approximately 29 responses. The Census Bureau thoroughly reviewed and analyzed all responses to the RFI. The responses enabled the Census Bureau to learn that some vendors had greater experience, capabilities, and understanding of our requirements.

The Census Bureau then conducted further market research to gain more information. The additional research included requesting demonstrations from several vendors with COTS products that had the capabilities described in the RFI to demonstrate how the products could meet the needs.

The market research process (including the RFI, as well as vendor demonstrations), enabled the Census Bureau to learn more about the vendors' COTS products, their ability to meet our requirements, and view additional functionality that could help enable scalability and reduce risk for the 2020 Census. This process resulted in well-defined requirements in the Request for Quotations (RFQ), issued on September 2, 2015.

The Census Bureau awarded Purchase Orders on September 30, 2015, to all five of the vendors that submitted proposals in response to the RFQ to purchase product licenses. This allowed for further assessments (physical and engineering), acceptance testing, and analysis of the vendors' tools. At the conclusion of the first testing and evaluation phase for all five COTS products, the Census Bureau was able to reduce the number of vendors down to two that met all programmatic requirements.

To ensure a robust and scientific evaluation, the Census Bureau contracted with the Carnegie Mellon Systems Engineering Institute to guide and support a COTS Capability Assessment Analysis (CCAA). The Bureau established many teams to participate in the CCAA, including a core team of Census Bureau technical staff, the Office of Innovation and Implementation, and Carnegie Mellon staff; Census Bureau Information Technology subject matter experts; Census Bureau business subject matter experts; and the Census Bureau's Executive Guidance Group, who advises and supports enterprise solution teams at the Census Bureau.

The CEDCaP Executive Steering Committee set the focus of CCAA process on 2020 Census programmatic requirements. To prepare, staff began the assessment of requirements related to 2020 Census scope, system capabilities and schedules in November 2015. The programmatic team identified core capabilities and future testing needs while the Information Technology staff began assessing all overall system and testing needs. By January 2016, the teams determined the mission critical requirements to support the 2020 Census. These requirements were used as the foundation of the CCAA 90-day proof of concept prototype/configuration effort.

A key component of the CCAA was the 90-day proof of concept cycle for the two vendors. The vendors installed their systems allowing Census Bureau staff to review and test their products. Then the development cycle kicked off with five development sprints (typically 10 days per sprint) to evaluate various components of the products and demonstrate if the vendors could deliver key capabilities. At the end of each agile sprint, they conducted a demonstration to Census Bureau teams to validate they met the committed business requirements.

Both vendors completed the 90-day cycle and were evaluated on five factors: Business Functional Need (the degree the solution satisfied the defined business requirements), System Design (the degree the solution satisfied architectural quality attributes), Schedule (the degree the solution could be confidently deployed to meet the required timelines), Cost (the relative comparison of estimated five-year total cost of ownership for the solution) and Vendor/ Development Team Viability (an indicator of the vendor/development team and tool's ability to meet the Bureau's long term needs). Each factor was weighted based on inputs from the Census Bureau teams and facilitated by Carnegie Mellon.

Both COTS platforms as well as internal solutions were evaluated and scored on each of the five factors and compared to the overall total possible score for that factor. Of the five factors considered, the chosen platform scored the highest on four factors (System Design, Schedule and Cost, and Vendor Viability), and was second on the fifth (Business Functional Need). We recorded the complete details outlining the CCAA approach, assessment, analysis and recommendations in the CEDCaP COTS Capability Assessment and Analysis Report. The COTS solution brings the experience of an industry leader with a long history in the market which, combined with the CCAA findings, demonstrates their ability to meet the needs of the 2020 Census program.

Decision

The 2020 Census Program will use a Commercial Off-the-Shelf (COTS) platform, which is part of CEDCaP Segment Architecture for the data collection component within the Business Solution Architecture for the 2020 Census.

The 2020 Census Memorandum Series

The 2020 Census Memorandum Series documents significant decisions, actions, and accomplishments of the 2020 Census Program for the purpose of informing stakeholders, coordinating interdivisional efforts, and documenting important historical changes.

A memorandum generally will be added to this series for any decision that meets the following criteria:

1. A major program-level decision that will affect the overall design or have a significant effect on the 2020 Census operations or systems.

2. A major policy decision or change that will affect the overall design or significantly impact the 2020 Census operations or systems.

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